

## BEHAVIORAL GERONTOLOGY: APPLICATION OF BEHAVIORAL METHODS TO THE PROBLEMS OF OLDER ADULTS

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Elderly persons are under-represented in research and clinical applied behavior analysis, in spite of data suggesting that behavior problems are quite prevalent in both community dwelling and institutionalized elderly. Preliminary investigations suggest that behavioral procedures can be used effectively in treating various geriatric behavior problems. We discuss a number of areas within behavioral gerontology that would profit from additional research, including basic field study, self-management, community caregiver training, institutional staff training and management, and geriatric behavioral pharmacology. Special considerations for adapting behavioral procedures are discussed, and suggestions for expanding the role of behavior analysis in geriatric care are offered.

**DESCRIPTORS:** behavioral gerontology, elderly, geriatrics, behavioral analysis, behavioral treatment

Since its inception, gerontology has been guided by a biological decrement model of aging (Baltes & Barton, 1977). Although it is undeniable that certain abilities decline with advancing age, altered environmental conditions often interact with biological variables in the elderly to produce behavioral deficits or excesses. Environmental factors affect behavior in two ways. First, as described by Lindsley (1964) and later by Skinner (1983), the aged person has deficits limiting the range of discriminative stimuli that can control behavior in ordinary environments. Second, the contingencies of reinforcement for the elderly can be conducive to ineffective behavior. Behavioral gerontology is the study of how antecedent and consequent environmental events interact with the aging organism to produce behavior. A number of recent reviews of behavioral gerontology is available, and the reader is referred to these sources (Baltes & Barton, 1977; Hussian, 1984; Patterson & Jackson, 1980; Williamson & Ascione, 1983; Wisocki, 1984). In this paper, we discuss the current

status of behavioral gerontology and offer suggestions for future research.

It is commonly acknowledged that the field of behavioral gerontology is just developing (Williamson & Ascione, 1983). Wisocki and Mosher (1982) surveyed the existing literature and found that 107 articles had been published between 1964 and 1980 describing behavior analysis or intervention with elderly persons. Their data also indicate that the field was virtually nonexistent before 1972. A marked increase in published articles did occur in 1973; however, the mean number of articles published between 1973 and 1980 was only 11 per year. L. D. Burgio (1985) surveyed the literature between 1981 and 1984 and found that there had been no increase in the yearly mean rate of articles published.

One may be tempted to conclude that the dearth of research in behavioral gerontology is due to a low prevalence of behavior problems in the elderly. Although data on the incidence of behavior problems among the elderly are sparse, discussions of behavioral deficits and excesses are becoming more common in the gerontology literature (Brody, Kleban, Lawton, & Silverman, 1971; Pinkston & Linsk, 1984; Salamon & Trubin, 1983). In the community, behavior problems are commonly cited as major causes of caregiver stress (Zarit, Reever, & Bachman-Peterson, 1980) and they have

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been found to be a major determinant in institutional placement (Tobin & Lieberman, 1976).

The incidence of geriatric behavior problems in institutional settings has been investigated in two studies. Zimmer, Watson, and Treat (1984) surveyed 42 nursing homes and found that 64% of the 3,456 residents were described by head nurses as displaying significant behavior problems. Of the total sample, 23% had what were defined as serious behavior problems. Burgio, Tice, and Engel (1985) interviewed the primary care personnel of an urban nursing home regarding behavior problems exhibited by their 154 elderly patients. The interviewer presented behavioral definitions for 23 behavior problems commonly displayed in institutional settings. Caregivers were asked to report whether the problem behaviors were displayed by each patient. Results show that all 23 of the behavior problems occurred in the nursing home. Some were displayed by only a few patients (e.g., pica was displayed by 1% of the patients); other problems, such as mobility and incontinence, were displayed by the majority of the patients (92% and 82%, respectively). The results of these studies suggest that behavior problems are common in geriatric long-term care settings.

It should be noted that all of the problems surveyed by Zimmer et al. (1984) and L. D. Burgio et al. (1985) have been treated with some degree of success in nonelderly populations, and many of them have been examined with the elderly (Williamson & Ascione, 1983). These preliminary investigations suggest that behavioral procedures show great promise for improving the lives of elderly persons.

The remainder of this paper will address areas of investigation in behavioral gerontology, which, we believe, would profit from additional research.

### *Field Study*

As behavior analysis was beginning to emerge as a distinct discipline, Bijou, Peterson, and Ault (1968) published their classic paper emphasizing the role of descriptive and experimental field studies. Although our level of knowledge in certain areas of applied behavior analysis has advanced past the level of field study (e.g., classroom be-

havior management), we have hardly begun to examine the natural functional relationships between the behavior of the elderly and their environments.

In a series of studies conducted in geriatric long-term care settings (Baltes, Burgess, & Stewart, 1980; Baltes, Orzech, Barton, & Lago, 1983; Lester & Baltes, 1978), Baltes and her colleagues observed dependent and independent resident behaviors and caregiver responses to these behaviors. Their results indicated that dependent behavior was likely to be followed by positive attention from the staff, whereas independent behavior was most likely to be followed by no staff response. Baltes concluded from these studies that nursing home environments reinforce dependent behavior. These findings allow us to determine how the environments of elderly persons may be deficient in providing conditions for maintaining effective behavior. They can also suggest how the current environment can be altered to produce more adaptive functioning. In institutional settings, field investigations may yield useful information about environmental conditions that contribute to the low rates of social interaction and engagement in activities often observed in these settings. In the community, investigators could examine factors responsible for elderly persons' frequent failure to use some of the resources that have been made available to them by various social agencies.

### *Behavioral Gerontology in the Community*

Ninety-five percent of persons 65 or older live in the community. Fourteen percent of men and 38% of women in the community live alone (Current Population Reports, 1984). It has been estimated that 10% to 20% of the elderly in the community have a significant degree of memory deficit, disorientation, or decline in intellectual performance, which can contribute to behavioral excesses or deficits (Group for the Advancement of Psychiatry, 1965).

Although the majority of community dwelling elderly do not experience these deficits to a significant degree, the normal life changes of the elderly (e.g., retirement or the death of a spouse) can result in a significant loss of reinforcers and sub-

sequent loss of adaptive functioning. An important goal for elderly individuals is to arrange their environment to compensate for any environmental or biological deficit associated with advancing age. For example, behavioral procedures have been used to increase the elderly's participation in recreational community events (Pierce, 1975) and participation in a foster grandparent program (Fabry & Reid, 1978). A more preferable strategy may be to use behavioral procedures to prepare the elderly for life changes and thereby prevent the development of behavior problems.

At least two general strategies seem practical for preventing or compensating for these deficits: teaching behavioral self-management skills to the elderly and training caregivers in the use of behavior management procedures.

*Self-management.* Behavioral self-management procedures have been used to effectively treat behavior problems in a number of clinical and normal populations (Kanfer & Karoly, 1982). Many of the procedures seem applicable to elderly clients living in the community and should be considered for those persons living alone. What is particularly attractive about behavioral self-management is that, once clients learn these skills, they may be able to adapt them to other problem behaviors with relatively minimal therapist contact. Unfortunately, very few researchers have investigated the application of behavioral self-management with the elderly, although self-management components have been incorporated into treatment packages.

Whitehead, Burgio, and Engel (1985) used self-directed scheduled toileting and biofeedback to teach self-management skills to 17 elderly patients with fecal incontinence. Patients showed an average 78% reduction in the frequency of fecal incontinence. Burgio, Whitehead, and Engel (1985) used a treatment package that included self-monitoring, self-directed scheduled toileting, pelvic floor exercises, and biofeedback in the outpatient treatment of urinary incontinence. The treatment resulted in a mean 85% reduction of incontinence in 39 elderly patients.

Assuming that further research will demonstrate the efficacy of behavioral self-management procedures with elderly clients, how are these procedures

to be disseminated to a cohort that is notorious for its avoidance of mental health professionals (German, Shapiro, & Skinner, 1985)? One solution may be to use existing health care professionals, such as visiting nurses and social workers, who already have frequent contact with elderly persons in the community. These professionals can be trained in behavior analysis and intervention and can, in turn, teach self-management skills to elderly clients during outpatient or home visits (see Linsk, Pinkston, & Green, 1982, for an illustration of behavior analysis in geriatric social work practice).

*Caregiver training.* Eight percent of elderly men and 16% of elderly women over age 65 live in homes of family members (General Accounting Office, 1977) and are dependent on them to some degree. As discussed above, the emergence of behavior problems in elderly clients can lead to caregiver stress and is thought to be a leading determinant in a family's decision to institutionalize an elderly relative. Pinkston and her colleagues have advocated teaching family members behavioral skills that will help them prevent behavior problems or will help them manage these problems if they occur. Their intervention program, termed the Elderly Support Project, was adapted from the parent-training literature. Results obtained to date suggest that the program has been effective in helping families to care for their dependent elders and to avoid institutionalization (Linsk et al., 1982; Pinkston & Linsk, 1984). More research is needed in this important area. For example, in addition to training family members, behavior analysts might develop procedures for teaching behavioral skills to care providers in other settings such as adult day care centers and group homes, living arrangements that are expected to receive increasing emphasis in the future.

### *Behavioral Gerontology in Institutional Settings*

Although nursing homes will continue to provide basic physical care to chronically ill elderly patients, health care professionals are learning that, by using a therapeutic training model (often referred to as a rehabilitative model in the geriatric

literature), many institutionalized patients can return to the community. They are also beginning to recognize that those persons who require the structure of an institution can gain a higher level of functional skills.

Based on the results of her series of field studies showing that staff tended to reinforce dependent patient behavior, Baltes proposed that if staff would instead reinforce independent patient behavior, the occurrence of these behaviors would increase (Baltes & Barton, 1977). Common dependent behaviors in the elderly include restricted mobility, incontinence, and reliance on staff assistance for self-care activities (Silberstein, Kossowsky, & Lilus, 1977). Initial attempts to increase mobility (Burgio, Burgio, Engel, & Tice, 1986; MacDonald & Butler, 1974), to improve self-care skills such as self-feeding (Baltes & Zerbe, 1976), and to treat incontinence (Schnelle, Traugher, Morgan, Embry, Binion, & Coleman, 1983) with behavioral procedures have been successful.

As behavior analysts have found in other institutional settings, the outcome of efforts to increase and maintain functional skills depends heavily on the quality of training for direct-care staff (in this case, nursing aides) and the presence of a system of staff management. A recent review of the literature reports that nursing aides have little understanding of how their behavior affects that of their patients (L. D. Burgio, *in press*). Staff training in geriatric long-term care is often brief and relies heavily on didactic techniques that frequently are insufficient for changing staff behavior (Whitman, Scibak, & Reid, 1983). Also, the development of contingencies to ensure that staff will perform previously learned skills in the natural environment has not been examined in this setting. Behavior analysts have developed and evaluated a number of effective staff training and management procedures that are employed in facilities for the developmentally delayed and, to a lesser extent, in psychiatric facilities. Researchers should focus on adapting these procedures to the needs of geriatric long-term care settings.

Another important area of investigation is the

behavioral assessment of the effects of psychotropic medication with elderly clients. About 35% of community dwelling elderly and up to 75% of patients in long-term care facilities receive psychotropic medication (Vestal, 1985). The use of psychotropic medication is of particular concern with elderly persons because the physiological changes of normal aging render these clients more susceptible to the adverse side effects of medication. A recent review of research on the efficacy of anti-psychotic medications in the treatment of behavior problems (Helms, 1985) reports that only 21 such studies have been done since 1952. The vast majority of these studies displayed significant design flaws. Moreover, all of the studies assessed efficacy primarily through the use of global response ratings; none of the studies examined the effects of medication on overt response frequency. Geriatric behavioral pharmacology appears to be a fertile area of research. Because psychotropic medication is prescribed primarily to control "behavioral complications," studies are also needed to examine the comparative efficacy of medication and behavioral procedures.

Finally, we believe that the design of prosthetic environments for the elderly will receive increasing emphasis in the future, particularly if the medical profession and other members of the community voice reservations regarding the application of behavioral consequences to geriatric residents in long-term care settings. The design of prosthetic environments is one of the better researched areas in behavioral gerontology. Behavior analysts have examined the effects of furniture rearrangement on social interaction (Peterson, Knapp, Rosen, & Pither, 1977; Sommer & Ross, 1958), the effects of private versus multiple-bed rooms on personal hygiene and mobility (Lawton, Liebowitz, & Charon, 1970), and the effect of using simple discriminative stimuli to control wandering (Hussian, 1982) and appropriate toileting (Pollock & Liberman, 1974).

Further research is needed. For example, an experimental analysis could be conducted of the relationship between various features of the physical

environment and falls in the elderly. The type and spacing of lighting, floor design patterns, placement of hand railings, and the height of stairs are just a few variables that contribute to falls. An experimental analysis of these and other features of the nursing home will allow us to design safer environments for the elderly.

### *Adapting Behavioral Technology to Elderly Clients*

Behavior analysts have developed a panoply of procedures that effectively change behavior. It would be naive and perhaps harmful for therapists to apply these procedures to elderly persons without consideration of the special needs of this population. Guidance in this area can be obtained from the human operant laboratories that have examined age-related differences in learning and performance (Baron, Menich, & Perone, 1983; Perone & Baron, 1982, 1983). Familiarity with this research can be helpful to behavior analysts when developing training procedures and when adapting currently used behavioral procedures for use with elderly clients.

Although results are preliminary, researchers have discovered a number of age-related factors that can affect performance. For example, it has been noted that the elderly tend to display more anxiety in training situations and that anxiety may adversely affect performance (Poon, Fozard, & Treat, 1978). Yesavage (1984) found that teaching elderly subjects to use relaxation skills during a memory task resulted in superior performance on name and face recall. Intellectual performance can be improved in the elderly by controlling for pretest fatigue (Furry & Baltes, 1973). Also, Perone and Baron (1983) found that age differences in the performance of complex response sequences could be reduced by gradually exposing elderly subjects to novel sequences and with the use of extended training.

Animal operant researchers have also uncovered a number of age-related differences in learning that should be considered by behavior analysts when they are developing training procedures. Goodrick

(1968) and Corke (1964) found that older rats show a much greater resistance to extinction than younger rats. Goodrick (1975) also found that errorless learning procedures facilitated learning in aged rats, and that massed practice (i.e., multiple trials per day) enhanced learning, particularly in slow-learning rats.

Lindsley (1964) originally discussed the critical issue of reinforcement in the elderly. He proposed that many elderly persons are exposed to insufficient reinforcement systems. Intermittent reinforcement schedules that control much of young persons' performance may be inadequate for some elderly people. They may function better in environments providing continuous reinforcement that is made to covary with the rate or intensity of the behavior emitted (conjugate reinforcement). However, the effects of schedules of reinforcement on the elderly have not been examined in the laboratory or in applied settings, and they appear to be an important area for future research.

When adapting behavioral procedures to elderly clients, special recognition must be made of the fundamental physiological changes in the elderly (Salthouse & Somberg, 1982) and the frequent decline in the health of these clients. Attempts to adapt the Foxx and Azrin (1973) toilet training procedure for use with the elderly provide an excellent lesson. Originally developed for toilet training the retarded, the Foxx/Azrin procedure is a multicomponent intervention that includes fluid loading and overcorrection. Several projects examining the use of variations of the procedure in the treatment of geriatric incontinence are currently in progress. Anecdotal reports by these researchers suggest that fluid loading is counterproductive with the elderly, apparently due to the limited ability of the aged bladder to accommodate increased volumes of liquid. Also, researchers have been reluctant to attempt procedures such as overcorrection with this population due to the often frail condition of the clients. Consequently, researchers have relied on scheduled toileting and positive reinforcement in the treatment of this difficult problem (Schnelle et al., 1983).

Assuming that behavior analysts will increase their involvement in treating geriatric behavior problems, it is incumbent upon researchers to assess the acceptability of their treatment procedures (Kazdin, 1980, 1981). Regardless of a treatment's effectiveness, many procedures remain unused because they are unacceptable to participants, caregivers, or consumers. Researchers have examined a range of acceptability issues in behavioral treatment of children, because children do not usually provide direct consent and do not have immediate recourse to those who administer treatment (Kazdin, 1981). Clearly, the same issues apply with demented community dwelling elderly and certainly with the institutionalized elderly. Research is needed to assess the acceptability of behavioral treatments by community caregivers and by medical and nursing staff in geriatric long-term care settings.

### *Summary and Conclusion*

The relatively small number of studies that have examined the use of behavioral procedures with the elderly suggests that these procedures can be used effectively with this population (Williamson & Ascione, 1983). However, our knowledge base in behavioral gerontology is still small. More research is needed to examine the incidence of behavioral deficits and excesses in community and institutional settings, the nature of person-environment interactions, and the efficacy of behavioral self-management procedures, staff training and management, and the training of community caregivers.

Considering the obvious role for the behavior analyst in solving the problems of the elderly, one must wonder why behavioral gerontology is only now emerging as a distinct specialty area, and why so few behavior analysts are currently active in the field. One possible answer is that, although population projections were available in the 1960s when behavior analysis was just starting to emerge as a separate discipline, it was not until the 1980s that the aging of America began to receive significant media attention (e.g., "Who's Taking Care of Our Parents?" 1985). As a result of such media

attention and attempts within our own discipline to highlight the importance of behavioral research on geriatrics, we hope that more behavior analysts will apply their skills to the problems of aging.

Behavior analysts should be aware that the paradigm shift from the medical to the behavioral model, which has largely been achieved in the treatment of the developmentally delayed, is unlikely to occur in geriatric long-term care. Many elderly persons have significant health problems requiring the constant presence of medical and nursing staff. Under these circumstances, a coexistence of the medical and behavioral training models is more appropriate. Consequently, if behavior analysts are to increase their participation in geriatric care, it is crucial that they collaborate with geriatricians and geriatric nurses. In support of this point, Guy and Morice (1985-1986) surveyed 89 mid-western nursing homes to assess current use of behavior management procedures. Their results indicated that 89% of behavior management programs employed a nurse as a primary behavior change agent.

Historically, behavior analysts have developed collaborations and achieved entry into new settings by demonstrating that their presence would in some way benefit the facility or program (Bailey & Bostow, 1979). In addition to demonstrating that elderly residents might benefit from behavioral interventions, devising procedures that reduce financial expenditure may convince administrators that collaboration with behavior analysts is desirable. An example of this is the potential of saving millions of dollars in diaper, laundry, and medical costs by the use of behavioral procedures to treat incontinence.

The final determining factor for the future of behavioral gerontology is the number of new students who will be entering the area in the coming years. It must be acknowledged that the variables controlling the behavioral gerontologist's research and treatment efforts may be different from those controlling specialists in other areas within behavior analysis. For example, many students find it rewarding to teach new skills to a handicapped child. Under optimal conditions, these skills can

maintain for a lifetime and can result in the child's placement in a less restrictive environment. By contrast, the life expectancy of an elderly person is often limited to a few years or months. Moreover, due to progressive organic degeneration, illness, or unexpected change in status, therapists often see a decrement in relearned skills that may have taken months to establish. Such experiences may discourage new students from entering or remaining in the field. Yet, there is no doubt that behavior analysts can improve the quality of life for many elderly persons, and many of these changes can endure for long periods of time. Behavior analysts have traditionally taken on difficult and frustrating problems and have supplied dedicated students to meet these challenges. We hope that behavioral gerontology will not prove to be the exception.

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